TROCHILA POPULORUM DESM.

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In a recent article, Potebnia* has called attention to the probable connection between *Marssonia Castagnei* (Desm. and Mont.) Sacc., a common fungus on certain species of *Populus,* and the discomycete, *Trochila Populorum* Desm. This connection had previously been suggested to him by Jaap. However, Potebnia is of the opinion that the discomycete is a *Pseudopeziza* rather than a *Trochila.* He arrived at this latter conclusion mostly from the similarity of artificial cultures obtained from *Marssonia Castagnei* spores, to cultures obtained from *Pseudopeziza Salicis,* the perfect stage of *Gloeosporium Salicis.* His material of the perfect stage of the *Populus* fungus was too scanty to be studied.

During the past three years, I have had this fungus under observation, trying to connect the *Marssonia* stage with the perfect form. While the study is not complete, and the connection between the *Marssonia* and the *Trochila* is not absolutely proven, it is impossible to carry on the study further on account of being out of the region where the fungus grows, and it is thought best to publish the observations as far as made.

The study of the poplar *Marssonia* was commenced in the summer of 1907, at Ithaca, New York. The fungus is very common in that region on *Populus alba,* forming numerous small dead spots on the leaves. The acervuli develop in abundance on the upper side of the spots. Two sorts of conidia develop in the spots, the large two-celled spores typical of *Marssonia,* and some small, somewhat cylindric to ellipsoid, one-celled spores. The small spores have since been found by Potebnia and are illustrated in his article.

Pure cultures were obtained from the *Marssonia* spores on sterilized bean pods in tubes. The fungus grew slowly, forming a very much localized growth, with the development after some time of the typical *Marssonia* spores.

* Potebnia, A. Beiträge zur Micromycetenflora Mittel-Russlands. Ann. Myc. **8**: 79–81. 1910.

In the autumn of 1907, diseased leaves were enclosed in wire nets and placed out of doors to winter. Being located in Louisiana in the spring of 1908, Mr. C. J. Humphrey, of the Botanical Department of Cornell University, kindly sent me the leaves from the nets, and also others picked up from under the affected white poplar trees. The leaves were received during the last part of



FIGS. 1–5. Asci, spores, and paraphyses of *Trochila Populorum*. × 750. 1. Mature asci. 2. An ascus, showing how the apex is ruptured when the spores are thrown out. 3. Ascospores. 4. Germinating ascospores. 5. Paraphyses and young asci.

April and May. In nearly all of the spots on nearly all of the leaves, there was an abundant development of an ascomycete which I determined as *Trochila Populorum*. Many attempts were made to culture the ascospores in 1908, but without success. The spores would not grow in acid media, and, in dilution cultures using ordinary media, bacteria and molds ruined the plates.

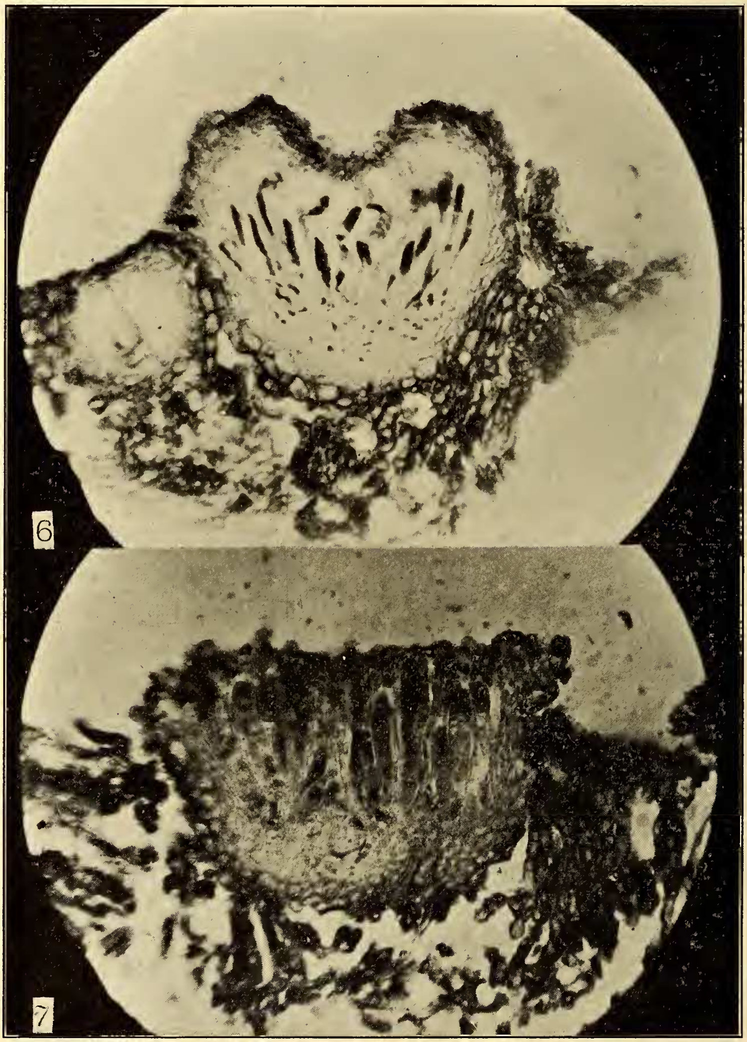
In the season of 1909, material was again sent me from Ithaca, and further attempts were made to culture the spores, though by a different method. The affected leaves were placed in a moist chamber and petri dishes containing sterile agar were inverted over them. As the apothecia opened up, the spores were shot out of the asci into the agar above. These spores germinated and I was able to transfer them to tubes. The germ-tube was sent out either from the side or at the end of the spore (*fig. 4*).

On sterilized bean pods and alfalfa stems, the fungus grew very slowly, finally forming a colony from one to two millimeters in diameter, when all growth ceased. The tubes were kept for nearly a year, some of them being transferred to see if further growth could be obtained. The cultures were examined occasionally, but I was never able to find any two-celled spores in them, being similar in this respect to Potebnia's cultures from the *Marssonia* spores themselves. As the cultures were made in Louisiana, perhaps the high temperature had much to do with the lack of development of the spores. Not being able to find the spores in the cultures, I was not able to prove absolutely the connection between the *Marssonia* and the *Trochila;* but from the fact that the *Trochila* always developed in the *Marssonia* spots, and also from the somewhat similar colonies in pure culture, with the exception of spore formation, it seems very probable that the two forms are connected.

In a letter from Dr. E. J. Durand, he states that *Trochila Populorum* has never been found in America, so far as he knows. This being the case, perhaps a short description may not be out of place.

The apothecia are at first somewhat globose, but as they grow older they generally become more or less flattened and concave at the top (*fig. 6*). The upper portion of the apothecium is forced out of the leaf during its growth, so that at maturity it projects some little distance from the surface of the leaf. The outer layer of the apothecium is composed of a pseudo-parenchymatous tissue of a dark-brown color. Inside of this, there is a more delicate layer of hyaline cells. The outer layer entirely surrounds the developing asci and paraphyses and is not broken apart at the top until the ascospores are nearly mature. In size, the apothecia

are about 90–140 × 100–190 μ. The asci are clavate, 12–14 × 60–80 μ, with the ascus wall thickened at the apex (*fig. 1*). This thickened apex is ruptured when the spores are shot out (*fig. 2*).



Figs. 6, 7. Apothecia of *Trochila Populorum*. × 330. 6. Young stage. 7. Nearly mature stage.

The spores are hyaline, one-celled, 12–16 × 5–7.2 μ, almost always containing two large guttulae, one at each end of the spore. The paraphyses are very abundant, 80–100, long, narrow, septate, and somewhat broadened at the apex.

It is possible that Potebnia is correct when he believes that this fungus should be placed in the genus *Pseudopeziza*, but, with the present classification, the dark outer layer of cells of the apothecia would cause it to remain in the genus *Trochila*.

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